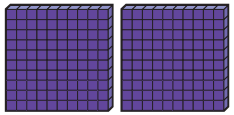
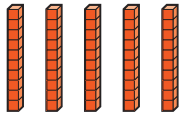
Number and Place Value — Knowledge Organiser

Key Vocabulary

- hundreds
- tens
- ones
- zero
- place value
- greater than
- less than
- order
- more
- less
- partition
- digit

3-Digit Numbers

256

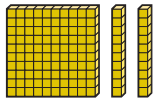
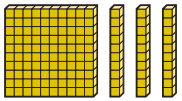
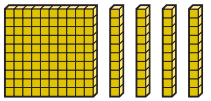
two hundred	fifty	six
		
200	50	6

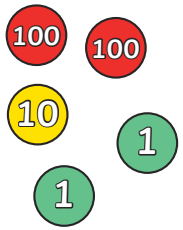
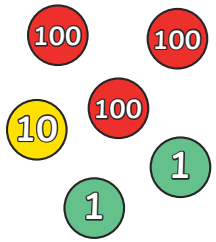
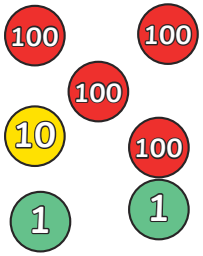
Counting in 4s and 8s

0	4	8	12	16	20	24	28	32	36	40

0	8	16	24	32	40	48	56	64	72	80

10 and 100 More or Less

Ten Less		Ten More
		
120	130	140

One Hundred Less		One Hundred More
		
212	312	412

Counting in 50s and 100s

0	50	100	150	200	250	300	350	400	450	500

0	100	200	300	400	500	600	700	800	900	1000

Number and Place Value

Knowledge Organiser

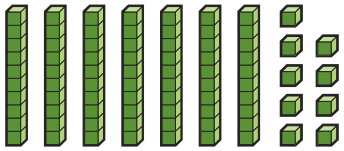
Compare and Order

100s	10s	1s
● ●	● ●	● ●
●		● ●

324 > 243

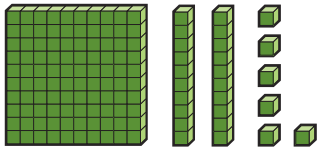
greater than

100s	10s	1s
● ●	● ●	● ●
	● ●	●



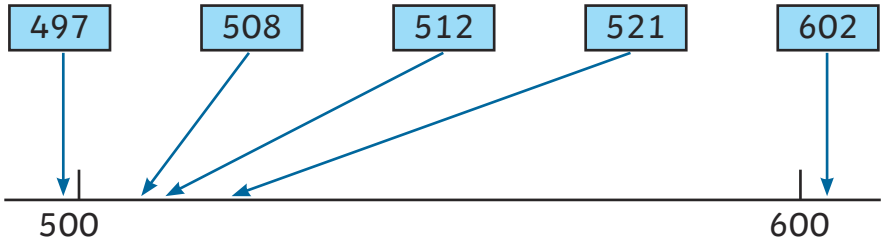
79 < 126

less than



smallest

greatest

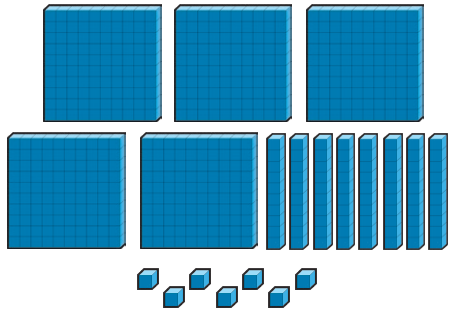


Represent Numbers to 1000

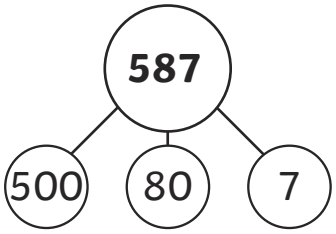
587

five hundred and eighty-seven

Hundreds	Tens	Ones
𝍸	𝍸 | | |	𝍸 | |

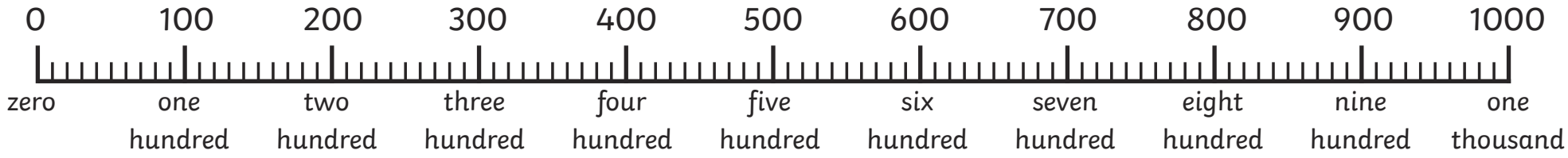


500 + 80 + 7



Hundreds	Tens	Ones
100 100 100 100 100	10 10 10 10 10 10 10 10	1 1 1 1 1 1 1

Numerals and Words to 1000



Addition and Subtraction Knowledge Organiser

Key Vocabulary

- add
- total
- plus
- sum
- more
- altogether
- difference
- subtract
- less
- minus
- take away
- column addition
- column subtraction
- exchange
- estimate
- inverse operation
- solve problems
- number facts
- place value

Addition and Subtraction Methods

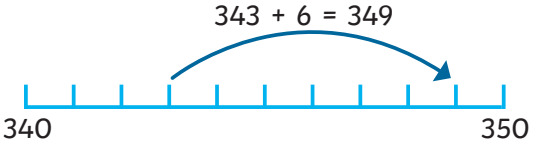
3-digit and 1-digit numbers

Not crossing 10s

268 – 4 = 264

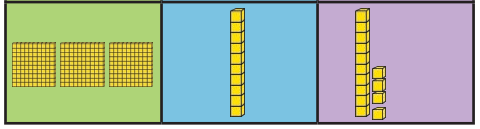
Hundred	Ten	Ones
●●	●●●	●●●●

343 + 6 = 349



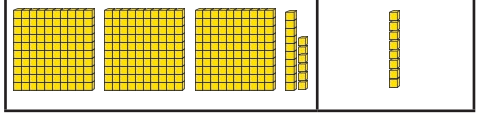
Crossing 10s (Exchanging)

324		
300	20	4
300	10	14



316 + 8 = 324

316	8



324 - 8 = 316

3-digit and 2-digit numbers

Add and subtract tens

Hundred	Ten	Ones
●●	●●●	●

451 + 3 tens = 481 (5 + 3 = 8)

451 – 4 tens = 411 (5 – 4 = 1)

Crossing 10s (Exchanging)

258 + 80 = 338

- Column method
- Count in 10s mentally
- Add 100, subtract 20

Crossing 10 and 100

$$\begin{array}{r} 368 \\ +73 \\ \hline 1 \\ \hline 1 \end{array} \qquad \begin{array}{r} 368 \\ +73 \\ \hline 41 \\ \hline 11 \end{array} \qquad \begin{array}{r} 368 \\ +73 \\ \hline 441 \\ \hline 11 \end{array}$$

$$\begin{array}{r} {\scriptstyle 3\,1} \\ 441 \\ -73 \\ \hline 8 \end{array} \qquad \begin{array}{r} {\scriptstyle 3\,13\,1} \\ 441 \\ -73 \\ \hline 68 \end{array} \qquad \begin{array}{r} {\scriptstyle 3\,13\,1} \\ 441 \\ -73 \\ \hline 368 \end{array}$$

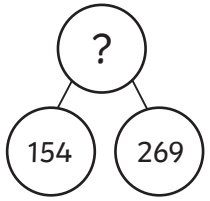
3-digit numbers

Not crossing

679 – 351 = 328

Hundred	Ten	Ones
●●●	●●●	●●●●

Crossing 10s (Exchanging)



$$\begin{array}{r} 269 \\ +154 \\ \hline 423 \\ \hline 11 \end{array}$$

514	
268	?

$$\begin{array}{r} {\scriptstyle 4\,10\,1} \\ 5\not{1}4 \\ -\ 268 \\ \hline 246 \end{array}$$

Add and Subtract 100s

284 + 300 = 584

Hundred	Ten	Ones
■■	▮▮	▪
■■■		

Addition and Subtraction — Knowledge Organiser

Estimate

Estimate by dividing the hundred into 250 and 225.

Estimate 10s (330, 340) between 325 and 350.

Estimate 167 – 89
Use near numbers 170 – 90 = 80

Near numbers:

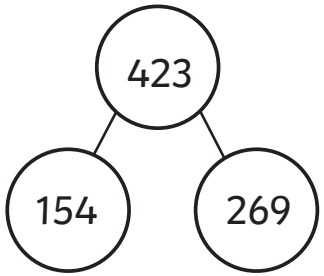
413	279	521	782
400	300	500	800

Check Answers

347 – 74 = 273 can be checked using

273 + 74 = 347

This part whole shows the inverse calculations using these three numbers.



154 + 269 = 423	269 + 154 = 423
423 – 154 = 269	423 – 269 = 154

Multiplication and Division

Knowledge Organiser

Key Vocabulary

- times tables
- multiply by
- divide by
- array
- fact families
- regrouping

Multiplication and Division Facts (3, 4 and 8 multiplication tables)

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

3 x Tables

1 × 3 = 3
2 × 3 = 6
3 × 3 = 9
4 × 3 = 12
5 × 3 = 15
6 × 3 = 18
7 × 3 = 21
8 × 3 = 24
9 × 3 = 27
10 × 3 = 30
11 × 3 = 33
12 × 3 = 36

3 ÷ 3 = 1
6 ÷ 3 = 2
9 ÷ 3 = 3
12 ÷ 3 = 4
15 ÷ 3 = 5
18 ÷ 3 = 6
21 ÷ 3 = 7
24 ÷ 3 = 8
27 ÷ 3 = 9
30 ÷ 3 = 10
33 ÷ 3 = 11
36 ÷ 3 = 12

4 x Tables

1 × 4 = 4
2 × 4 = 8
3 × 4 = 12
4 × 4 = 16
5 × 4 = 20
6 × 4 = 24
7 × 4 = 28
8 × 4 = 32
9 × 4 = 36
10 × 4 = 40
11 × 4 = 44
12 × 4 = 48

4 ÷ 4 = 1
8 ÷ 4 = 2
12 ÷ 4 = 3
16 ÷ 4 = 4
20 ÷ 4 = 5
24 ÷ 4 = 6
28 ÷ 4 = 7
32 ÷ 4 = 8
36 ÷ 4 = 9
40 ÷ 4 = 10
44 ÷ 4 = 11
48 ÷ 4 = 12

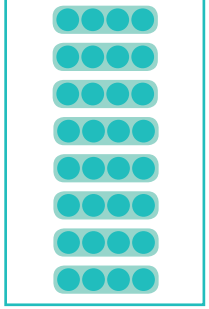
8 x Tables

1 × 8 = 8
2 × 8 = 16
3 × 8 = 24
4 × 8 = 32
5 × 8 = 40
6 × 8 = 48
7 × 8 = 56
8 × 8 = 64
9 × 8 = 72
10 × 8 = 80
11 × 8 = 88
12 × 8 = 96

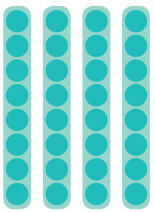
8 ÷ 8 = 1
16 ÷ 8 = 2
24 ÷ 8 = 3
32 ÷ 8 = 4
40 ÷ 8 = 5
48 ÷ 8 = 6
56 ÷ 8 = 7
64 ÷ 8 = 8
72 ÷ 8 = 9
80 ÷ 8 = 10
88 ÷ 8 = 11
96 ÷ 8 = 12

Write and Calculate Mathematical Statements

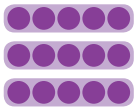
4 × 8 = 32
32 ÷ 8 = 4



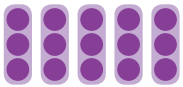
8 × 4 = 32
32 ÷ 4 = 8



5 × 3 = 15
15 ÷ 3 = 5



3 × 5 = 15
15 ÷ 5 = 3

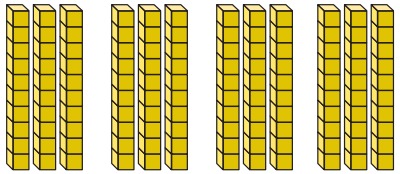


Related Calculations

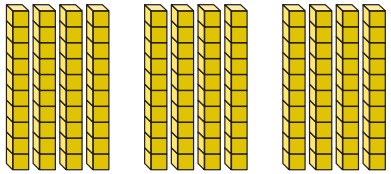
3 × 4 = 12

4 × 3 = 12

30 × 4 = 120



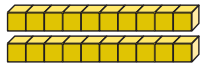
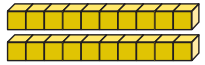
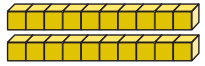
40 × 3 = 120



Multiplication and Division

Knowledge Organiser

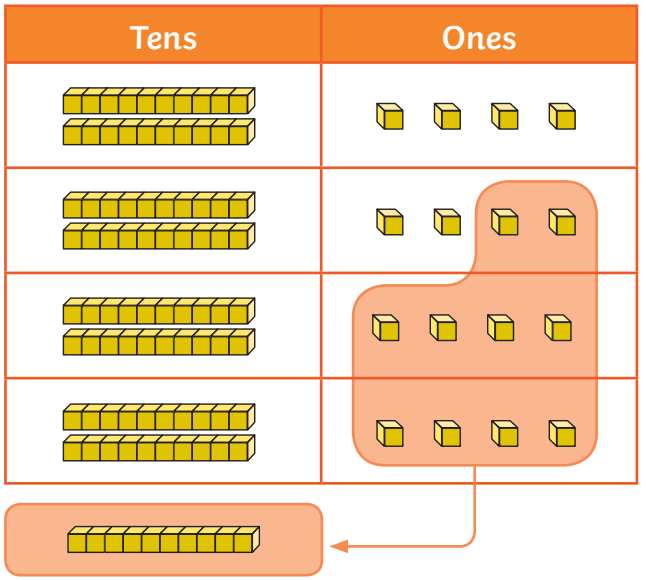
Written Multiplication Methods - No Regrouping

Tens	Ones
	
	
	

23 × 3 = 69

	T	O
	2	3
×		3
	6	9

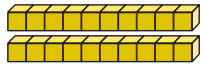
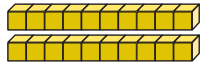
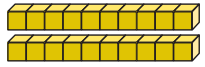
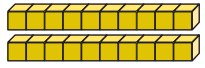
Written Multiplication Methods - With Regrouping



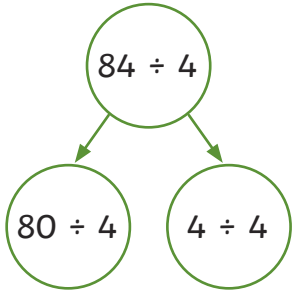
24 × 4 = 96

	T	O
	2	4
×		4
	9	6
	1	

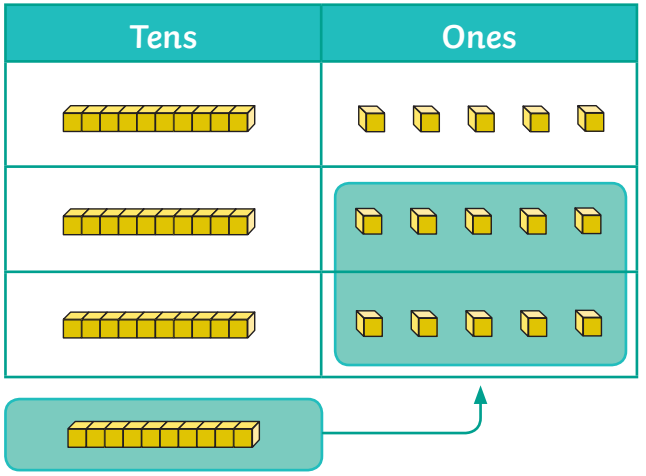
Written Division Methods - No Regrouping

Tens	Ones
	
	
	
	

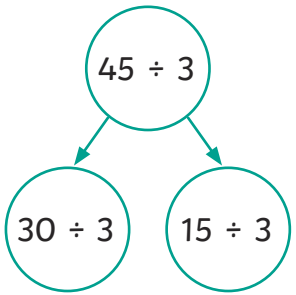
	2	1
4	8	4



Written Division Methods - With Regrouping



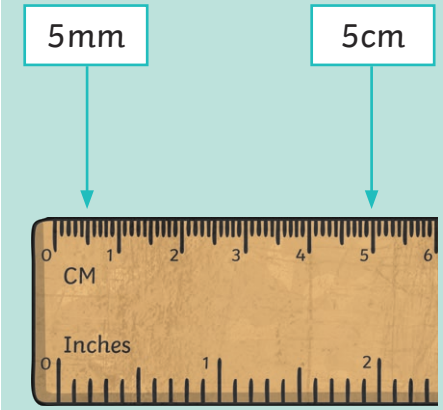
	1	5
3	4	$^{1}5$



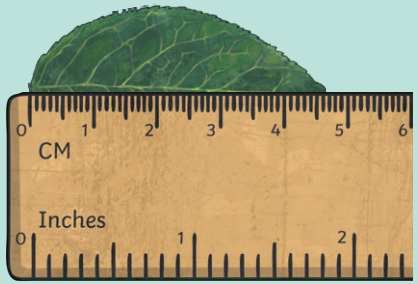
Key Vocabulary

metre (m)
centimetre (cm)
millimetre (mm)
height
length
width
perimeter
further/furthest
higher/highest
longer/longest
shorter/shortest
taller/tallest

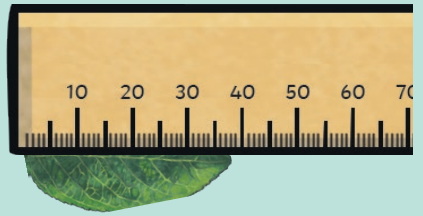
Measure Length



10mm = 1cm



4cm 6mm

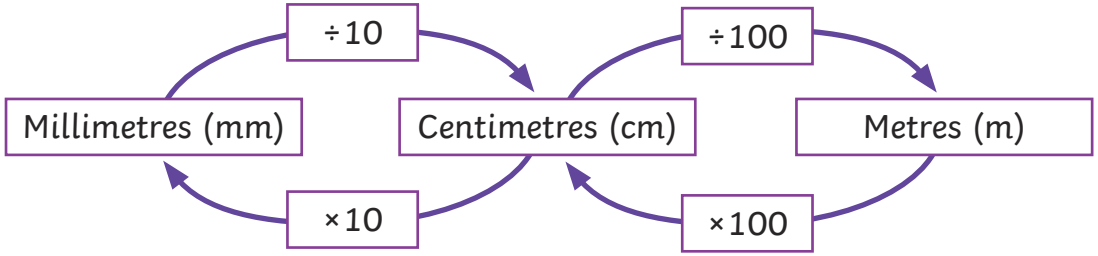


38mm

Equivalent Length

100 centimetres = 1 metre

10 millimetres = 1 centimetre



317cm	
300cm	17cm
3m	17cm
3m 17cm	

Compare Lengths

6mm < 6cm
6cm = 60mm
6mm is shorter than 6cm

320cm > 2m 60cm
320cm > 200cm + 60cm
320cm is longer than 2m 60cm

98mm < 12cm 3mm
98mm < 120mm + 3mm
98mm is shorter than 12cm 3mm

Add and Subtract Lengths

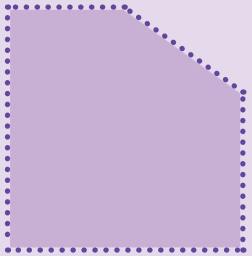
14cm + 19cm = 33cm
8cm 2mm + 16mm =
98mm or 9cm 8mm

?	
8cm 2mm	16mm
82mm	16mm

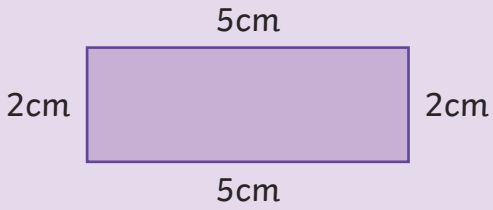
6m – 2m 28cm
6m – 2m = 4m
4m – 28cm = 3m 72cm

6m	
2m 28cm	?

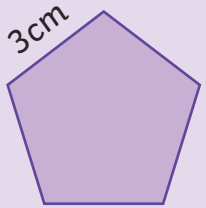
Perimeter



..... = perimeter



5cm + 2cm + 5cm + 2cm = 14cm



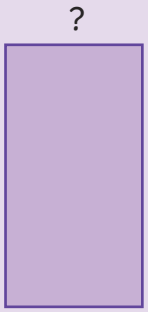
3cm + 3cm + 3cm + 3cm 3cm = 15cm

perimeter = 20cm

6cm + 6cm = 12cm

20cm – 12cm = 8cm

8cm ÷ 2 = 4cm



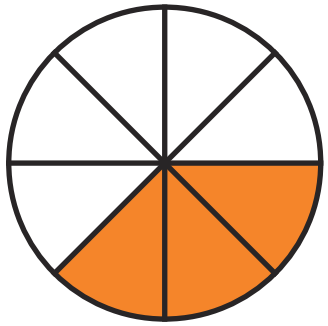
Fractions

Knowledge Organiser

Key Vocabulary

- numerator
- denominator
- unit fraction
- non-unit fraction
- equivalent
- halves
- thirds
- quarters
- fifths
- sixths
- eighths
- tenths
- decimal tenths

Recognising Fractions



$\frac{3}{8}$

Numerator
How many equal parts of the whole are needed?

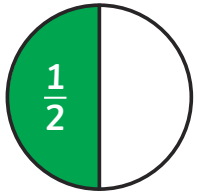
Denominator
How many equal parts are in the whole?

Comparing Fractions

$\frac{1}{3}$ Less than $\frac{2}{3}$

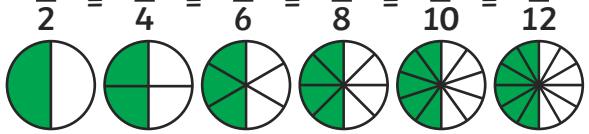
$\frac{4}{5}$ Greater than $\frac{3}{5}$

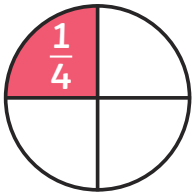
Equivalent Fractions



$\frac{1}{2}$ is equal to...

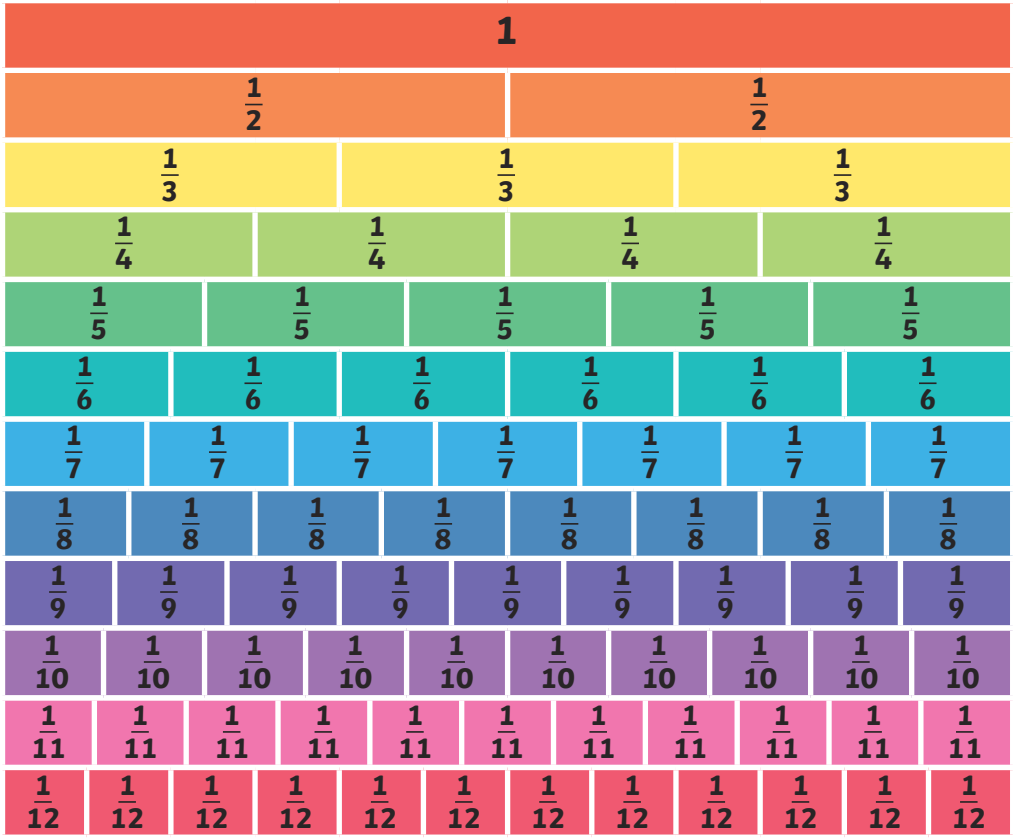
$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10} = \frac{6}{12}$





$\frac{1}{4}$ is equal to...

$\frac{1}{4} = \frac{2}{8} = \frac{3}{12} = \frac{4}{16} = \frac{5}{20}$



Fractions — Knowledge Organiser

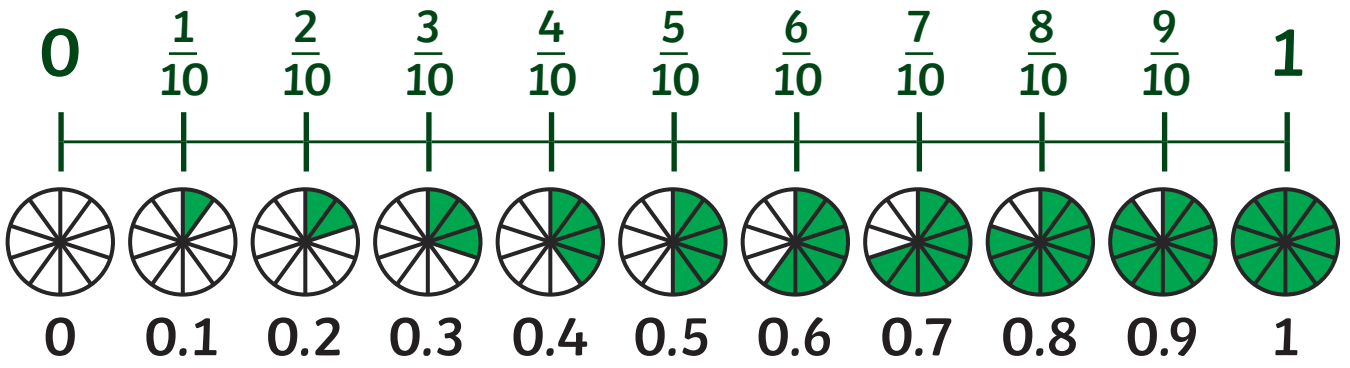
Add and Subtract Fractions

$\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$

$\frac{3}{7} + \frac{2}{7} = \frac{5}{7}$

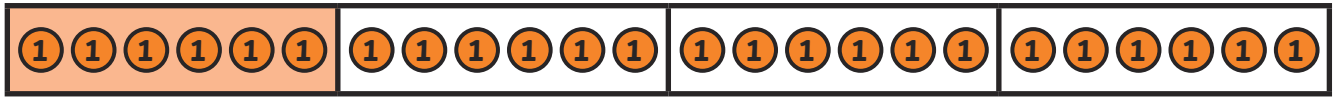
$\frac{5}{6} - \frac{2}{6} = \frac{3}{6}$

Tenths



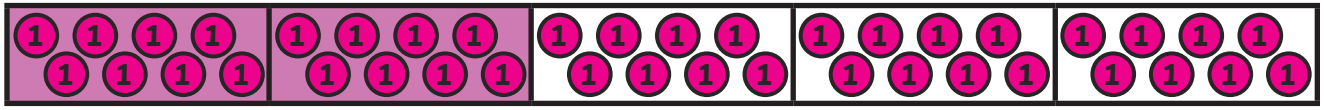
Fractions of Amounts

$\frac{1}{4}$ of 24 = 6



$\frac{1}{3}$ of 72 = 24

$\frac{2}{5}$ of 40 = 16



Mass and Capacity — Knowledge Organiser

Key Vocabulary

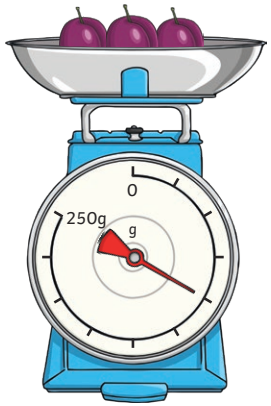
- mass
- gram
- kilogram
- capacity
- volume
- millilitre
- litre
- lighter
- heavier

Measure and Compare Mass

Scales can be used to measure grams.

A gram is a unit of measurement that is used to measure the mass of something.

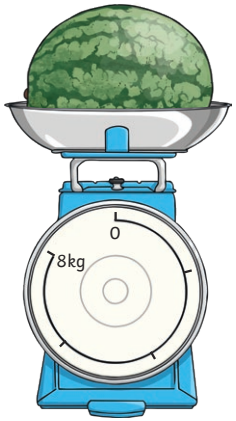
Grams can be written as **g**.



Scales can be used to measure kilograms.

A kilogram is a unit of measurement that is greater than a gram. It is also used to measure the mass of something.

Kilograms can be written as **kg**.



1000g = 1kg

To compare mass, we can use the words 'heavier' and 'lighter'.

Measure and Compare Capacity

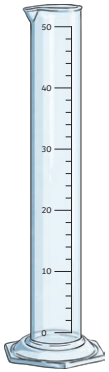
Capacity is the amount of liquid a container can hold.

Volume is how much liquid is in the container.

Measuring cylinders can be used to measure smaller volumes.

Smaller volumes are measured in millilitres.

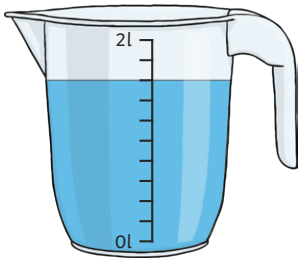
Millilitres can be written as ml.



Measuring jugs can be used to measure larger volumes.

Greater volumes are measured in litres.

Litres can be written as l.



1000ml = 1l

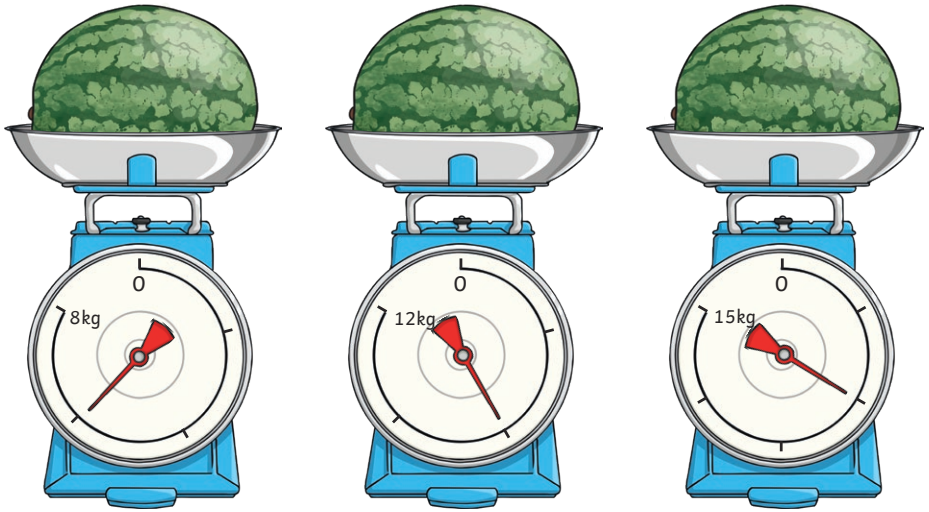
To compare capacities, we can use the word 'full'.

Reading Scales

Knowledge Organiser

Mass

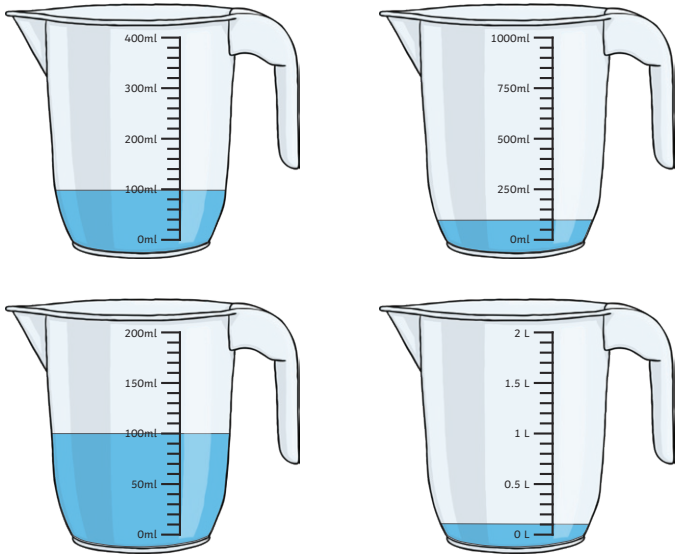
Each of the melons has a mass of 6kg but the arrows are all pointing at different points on the scales. This is because each of the measuring scales have different increments marked on them.



Always look carefully at how the numbers on the scales increase when reading a measurement.

Capacity

Measuring containers all have different capacities.

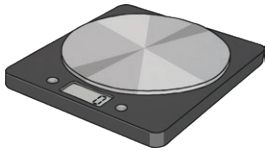


Each of these containers contain the same volume of 100 millilitres but have different capacities and scales. Always look carefully at how the numbers on the scales increase when reading a measurement.

Add and Subtract Mass

600g + 500g = 1100g = **1kg 100g**

1kg - 300g = 1000g - 300g = **700g**



Add and Subtract Capacities

800ml + 400ml = 1200ml = **1l 200ml**

1l 300ml – 200ml = **1l 100ml**

Money

Knowledge Organiser

Key Vocabulary

- amount
- change
- coin
- combinations
- convert
- note
- pence
- penny
- pounds
- value

UK Coins

1p
one penny coin

2p
two pence coin

5p
five pence coin

10p
ten pence coin

20p
twenty pence coin

50p
fifty pence coin

£1
one pound coin

£2
two pound coin

UK Notes

£5
five pound note

£10
ten pound note

£20
twenty pound note

£50
fifty pound note

Pounds and Pence

£3 and 25 pence

£52 and 13 pence

Convert Pounds and Pence

120 pence
100 pence is £1
120 pence is £1 and 20 pence.

Money

Knowledge Organiser

Adding Amounts

?	
£1 and 60p	

£1 and 60p + £1 and 52p

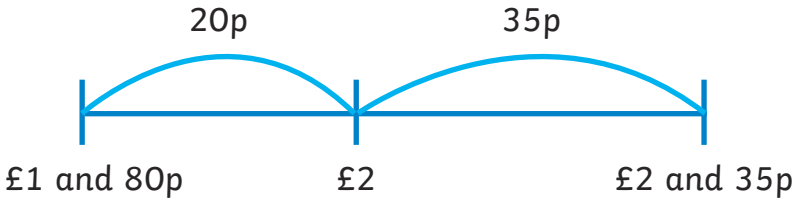
There is £2 and 112p.

112p is £1 and 12p

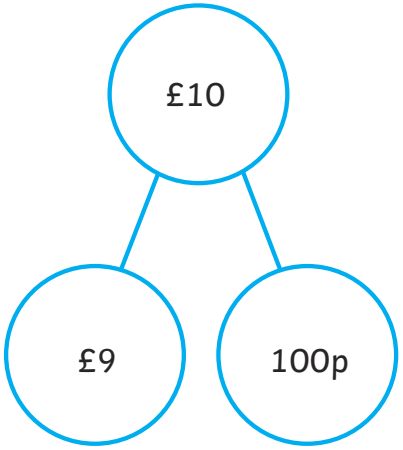
Altogether there is £3 and 12p.

Subtracting Amounts

£2 and 35p - £1 and 80p



Giving Change



£9 - £5 = £4

100p – 67p = 33p

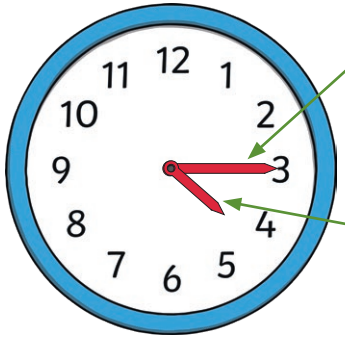
£4 and 33p change

Time — Knowledge Organiser

Key Vocabulary

- 12-hour time
- 24-hour time
- Roman numerals
- analogue
- digital
- hours
- minutes
- seconds
- o'clock
- half past
- quarter past
- quarter to
- midday
- midnight
- noon

Analogue and Digital Clocks

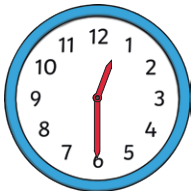


Minute Hand
The long hand points to the minutes past or the minutes to the hour.

Hour Hand
The short hand points to the hour. If this hand is pointing between hours, it is either past the earlier hour or to the later hour.

twelve o'clock

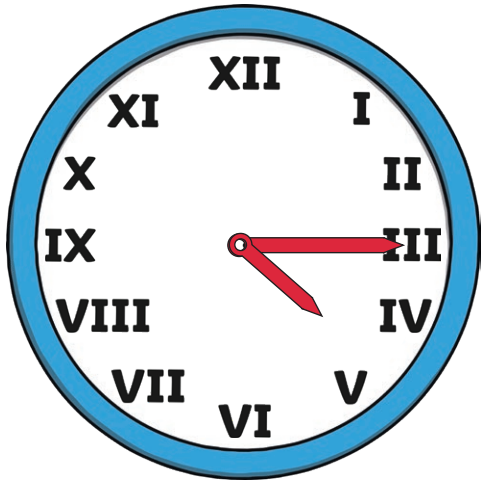
quarter past twelve



half past twelve

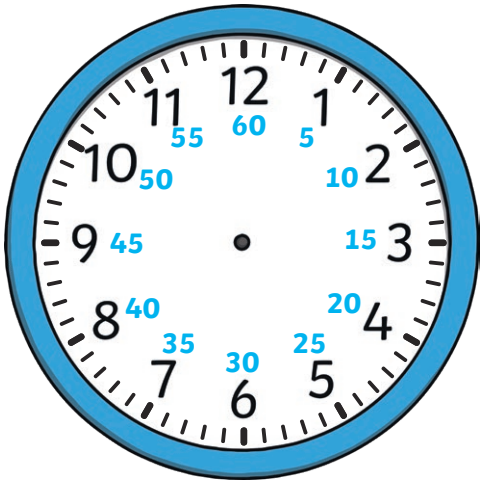
quarter to one

Time and Roman Numerals



Hours, Minutes and Seconds

There are **60 seconds** in an minute.



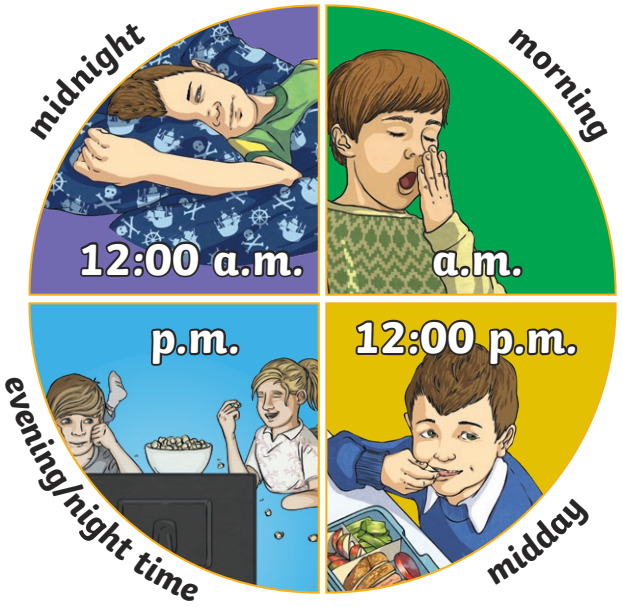
There are **60 minutes** in an hour.

Time

Knowledge Organiser

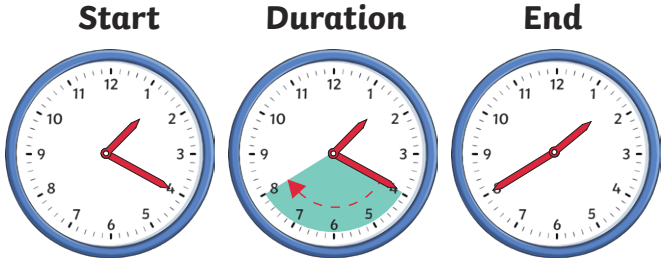
24-Hour Time

There are 24 hours in a day.



	13:00	1 p.m.	1 o'clock	
	14:00	2 p.m.	2 o'clock	
	15:00	3 p.m.	3 o'clock	
	16:00	4 p.m.	4 o'clock	
	17:00	5 p.m.	5 o'clock	
	18:00	6 p.m.	6 o'clock	
	19:00	7 p.m.	7 o'clock	
	20:00	8 p.m.	8 o'clock	
	21:00	9 p.m.	9 o'clock	
	22:00	10 p.m.	10 o'clock	
	23:00	11 p.m.	11 o'clock	
	00:00	12 a.m.	12 o'clock	

Calculate Durations of Time



20 minutes has passed.

Compare Durations of Time

Compare the time using the vocabulary 'longer' and 'shorter'.

180 seconds	**is the same as**	3 minutes.
90 minutes	**is shorter than**	2 hours.
48 hours	**is longer than**	1 day.

Properties of Shapes

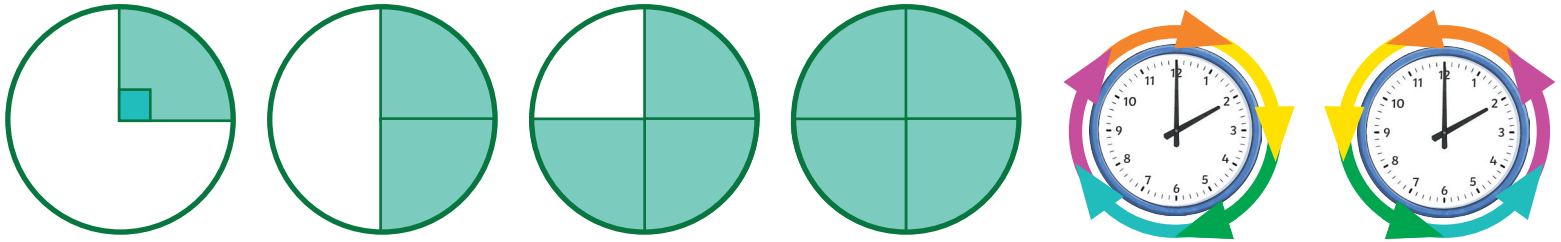
Knowledge Organiser

Key Vocabulary

- quarter turn
- half turn
- three-quarter turn
- angle
- right angle
- acute
- obtuse
- horizontal
- vertical
- parallel
- perpendicular
- polygon
- two-dimensional
- three-dimensional
- flat face
- curved surface
- edge
- curved edge
- vertex
- vertices
- apex

Turns and Angles

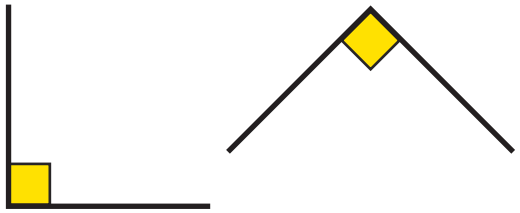
Angles can be used as a description of a turn.



$\frac{1}{4}$ turn | $\frac{1}{2}$ turn | $\frac{3}{4}$ turn | 1 turn | clockwise | anticlockwise

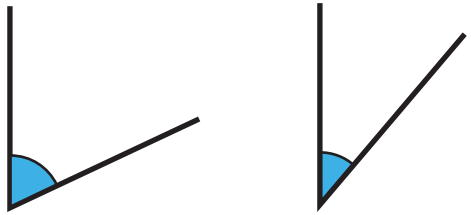
An angle is created when two straight lines meet at a point or intersect.

Right Angle



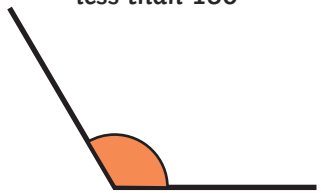
Acute Angle

Less than 90°



Obtuse Angle

Greater than 90° and less than 180°



Type of Lines

horizontal

vertical

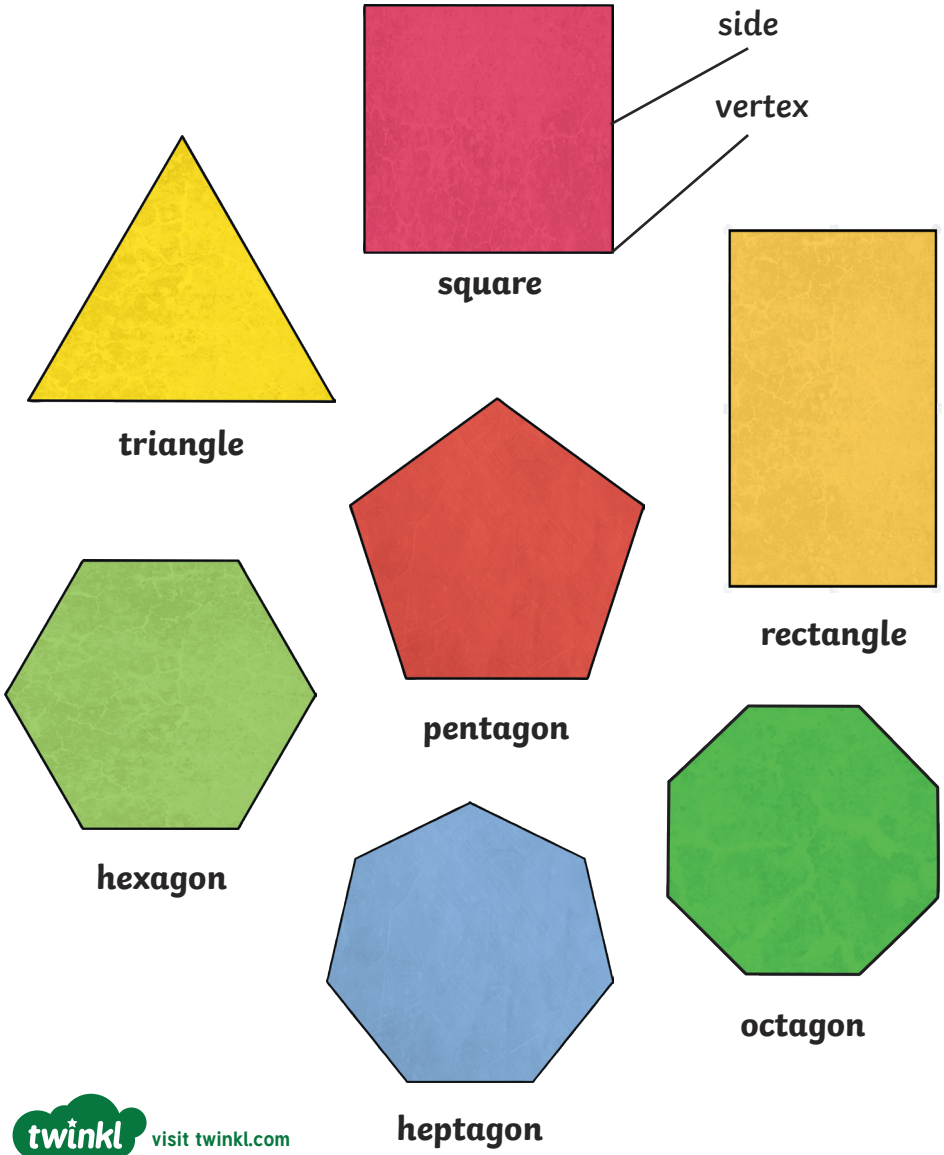
parallel

perpendicular

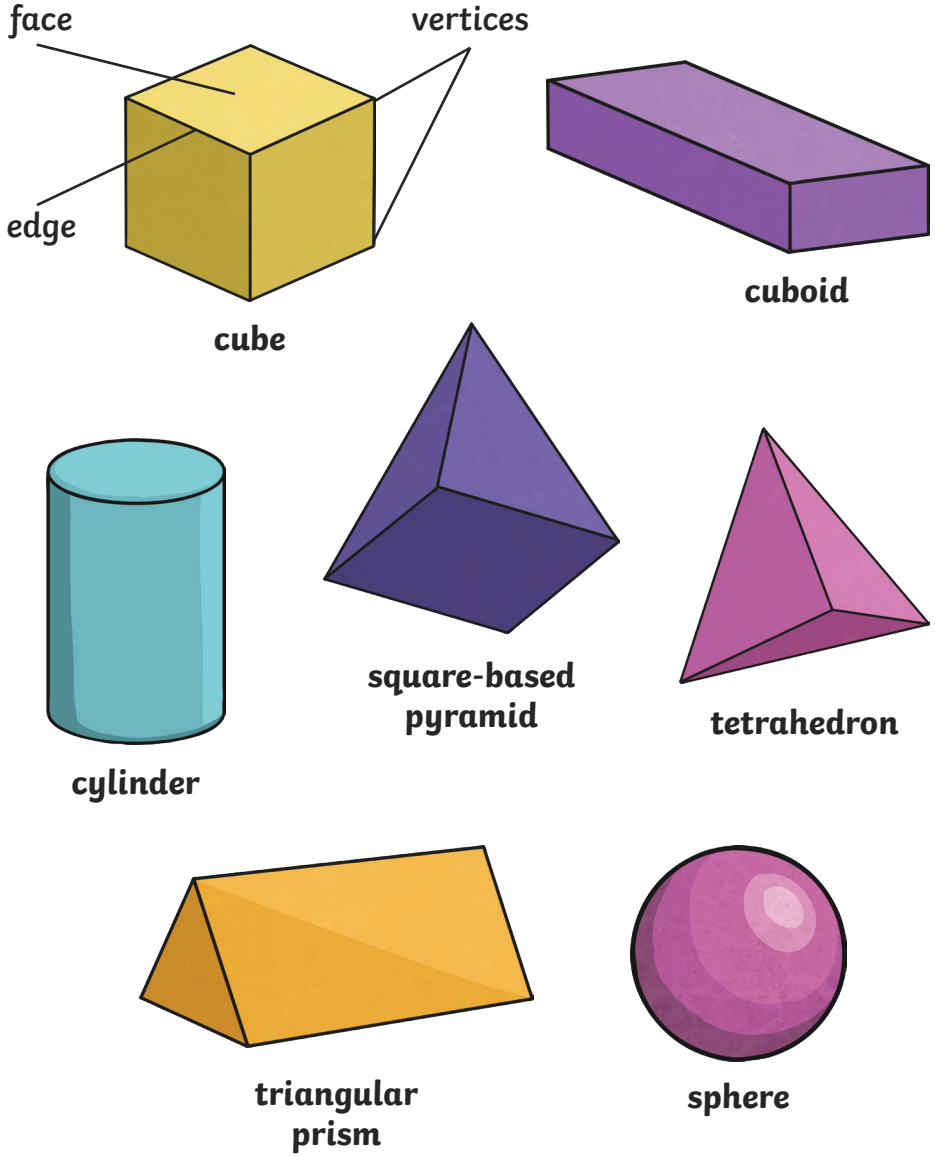
Properties of Shapes

Knowledge Organiser

Recognise and Describe 2D Shapes



Recognise and Describe 3D Shapes



Statistics — Knowledge Organiser

Key Vocabulary

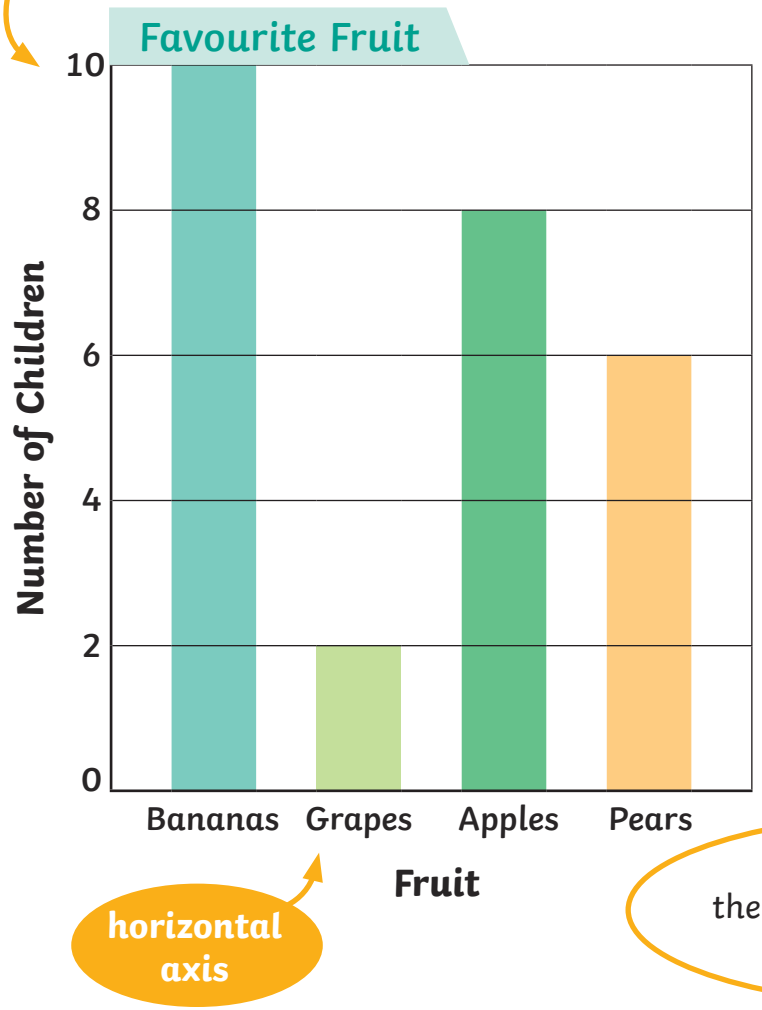
- data
- pictogram
- symbol
- bar chart
- horizontal axis
- vertical axis
- axes
- scale
- intervals
- table
- interpret

Bar Charts

Bars are used to show the data in each category. There must be a gap between each bar. Bar charts can have different scales.

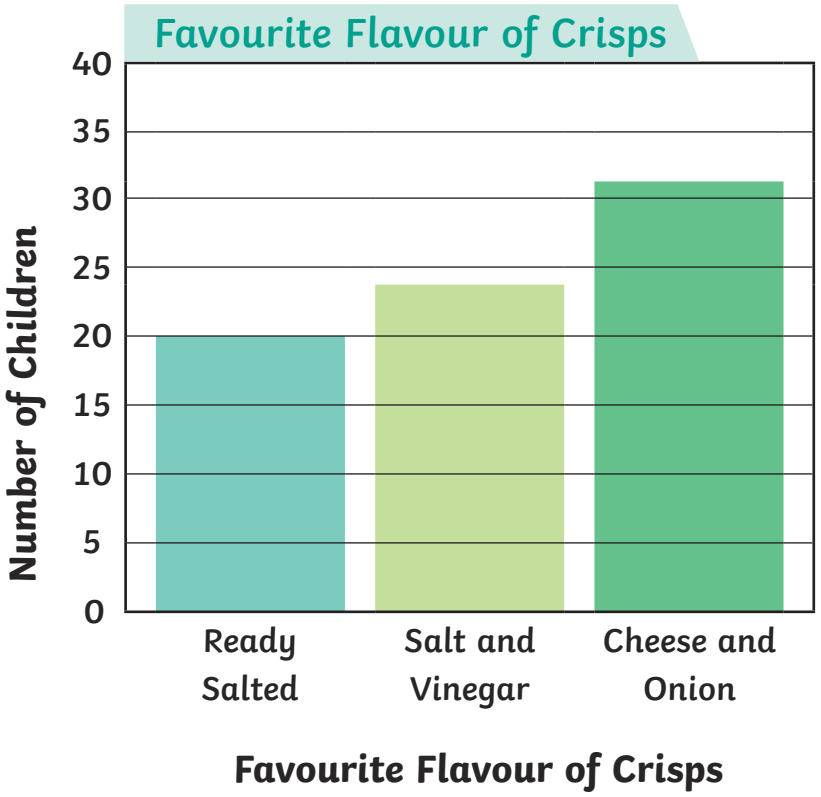
vertical axis

The scale on this bar chart counts in twos.



horizontal axis

The scale on this bar chart counts in fives.



The scale on the bar chart depends on the range of the data.

Statistics — Knowledge Organiser

Tables

In order to understand the data presented in a table, you must read the table's title and the headings. Remember to always look at the heading above each piece of information.

title

Table to Show Ticket Prices at a Local Cinema

heading

Ticket Type	Weekday Price	Weekend Price
Adult	£6	£7.50
Child	£4	£4.50
Student	£5.50	£6

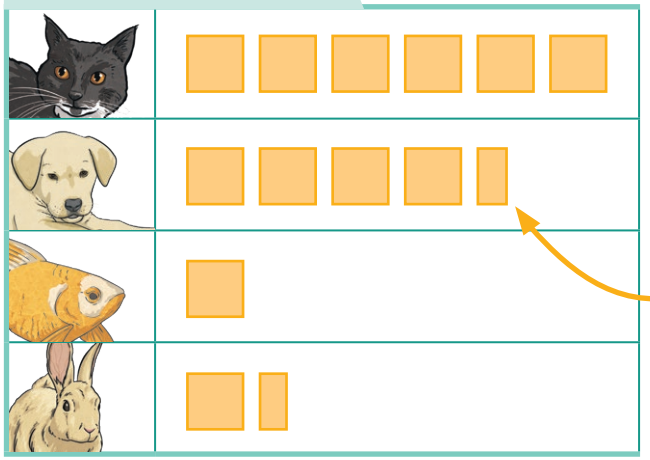
information

Using the table, we can see the cost of an adult and a child visiting the cinema on a Monday would be £10.

Pictograms

Pictograms use pictures or symbols to represent data. The key shows what each symbol represents. This pictogram uses 1 symbol to represent 2 pets.

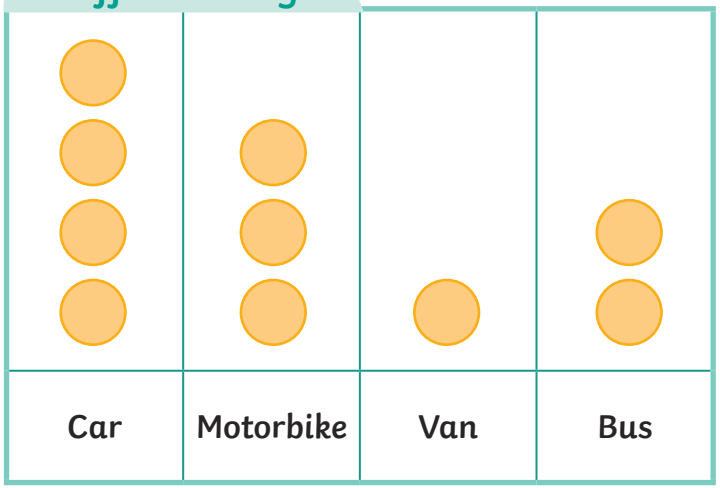
Class A's Pets



Key
= 2 pets

To represent 1 pet, a picture of half a square is used.

Traffic Survey



Key
= 8 vehicles

Using the key, we can see that 16 people travel by bus.